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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/708,926 | 04/01/2004 | Mark A. Fredette | 24.0808 | 2925 |
| 23718 | 7590 | 02/24/2006 | EXAMINER | |
| SCHLUMBERGER OILFIELD SERVICES 200 GILLINGHAM LANE MD 200-9 SUGAR LAND, TX 77478 | | | SCHINDLER, DAVID M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2862 | |

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/708,926 | FREDETTE ET AL. | |
| | Examiner | Art Unit | |
| | David Schindler | 2862 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 23-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-17, 19, 20, 22 and 35-40 is/are rejected.
- 7) ☒ Claim(s) 18, 21 and 37 is/are objected to.
- 8) ☒ Claim(s) 1-40 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Responsive to communications filed April 1, 2004

DETAILED ACTION

During a telephone conversation with Brigitte Echols on 10/26/05 a provisional election was made without traverse to prosecute the invention of Group II, claims 10-22, 35-40 as shown in the restriction action which follows. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9, 23-34 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9, 27-34, drawn a lateral resistivity sensor, classified in class 324, subclass 347.
- II. Claims 10-22, 35-40, drawn to a combination lateral and propagation tool, classified in class 324, subclass 342.
- III. Claims 23-26, drawn to disclosure of a shielding method for a lateral resistivity sensor, classified in class 324, subclass 338.

Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination of Group II as claimed does not require the particulars of the subcombination as claimed because a toroidal antenna is not required in Group II. The subcombination of Group II has separate utility such as a device for measuring resistivity in boreholes with shorter ratholes.

Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as a shielded transmission line. See MPEP § 806.05(d).

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as a shielded transmission line. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claim 37 is objected to because of the following informalities: Line 1 contains the claim number "37.". Claim numbers must be placed in brackets, additionally, this claim number is redundant. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 39 recites the limitation "the insulating mechanism" in Lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-15, 17, 19, 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Sinclair et al. (5428293).

With respect to Claim 10, Sinclair et al. disclose a resistivity logging tool (MWD resistivity system, Abstract) comprising :

a propagation or induction resistivity antenna disposed on an elongated tubular having a longitudinal axis and adapted for subsurface disposal (CWR system is wound axially about the drill collar and operates at 2 MHz (Col. 5, Lines 26-30, 53-60 and Fig. 2, receivers 15, 25 and transmitters 19, 29, 17, 27) also, high frequency transmission is associated with maximum depth of investigation (Col. 2, 19-23));

a lateral resistivity sensor disposed in a recess in the elongated tubular (HTR system is wound on toroidal forms positioned in grooves and operates at a few kHz (Col. 5, Lines 32-42 and Fig. 2, transmitter coils 16, 26 and receiver coils 14, 24) which is associated with shallow depths of investigation (Col. 2, Lines 19-23));

and a shield disposed on the tubular to cover the lateral resistivity sensor and adapted to prevent electric current flow in the shield in a direction parallel to the

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longitudinal axis of the tubular near the lateral resistivity sensor (coils are shielded, Col. 4, Lines 15-24) also, each sensor is sealed by epoxy resin potting (Col. 4, Lines 35-39)).

With respect to Claim 11, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose the lateral resistivity sensor comprises a toroid (HTR system is wound on toroidal forms, Col. 5, Lines 32-42).

With respect to Claim 12, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose an electrode on the tubular (monitor electrode on the mandrel, Col. 10, Lines 38-39).

With respect to Claim 13, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose that the lateral resistivity sensor comprises an insulating base layer (the base layer is understood to be the "donut shaped, magnetically permeable core" disclosed in the specification in Paragraph 0009) disposed in the recess in the tubular with a toroidal antenna disposed over the base layer (the HTR coils are wound on magnetically permeable toroidal forms positioned in grooves, Col. 5, Lines 32-35).

With respect to Claim 14, Sinclair et al. disclose the invention as shown in Claim 13 above, and further disclose that the toroidal antenna comprises a conductive wire disposed over the insulating layer (sensors are formed by loops on a bobbin (Col. 4,

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Lines 35-39), induction coil sensor loops are several turns of fine wire (induction coil reference, www.whatis.com)).

With respect to Claim 15, Sinclair et al. disclose the invention as shown in Claim 13 above, and further disclose that the toroidal antenna comprises a toroidal core formed from one of a magnetically permeable material wrapped in the tubular recess or a ferrite material disposed in the recess (the HTR coils are wound on magnetically permeable toroidal forms positioned in grooves, Col. 5, Lines 32-35).

With respect to Claim 17, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose that the shield comprises an insulating mechanism to prevent electric current flow along the shield in a direction parallel to the longitudinal axis of the tubular (coils are shielded, Col. 4, Lines 15-24) also, each sensor is sealed by epoxy resin potting (Col. 4, Lines 35-39), epoxy resin is insulating and nonconductive (MG Chemicals reference, specifications, Page 2)).

With respect to Claim 19, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose an electrically insulating material disposed between a junction formed between the shield and the tubular (each sensor is sealed by epoxy resin potting against corrosive borehole fluids (Col. 4, Lines 35-39), this method shields the sensor, which lie in grooves (coils are shielded, Col. 4, Lines 15-24)).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinclair et al. '293 as applied to Claim 10 above, and further in view of Sinclair et al. (6100696).

With respect to Claim 22, Sinclair et al. disclose the invention as shown in Claim 10 above, and further disclose that the tubular is a drill collar (formation properties tool is mounted on the drill collar, Col. 4, Lines 45-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinclair et al. '293 as applied to Claim 10 above, and further in view of Sinclair et al. (6100696).

With respect to Claim 16, Sinclair et al. '293 disclose the invention as shown in Claim 10 above, but lack a pressure compensating mechanism in the lateral resistivity sensor.

Sinclair et al. '696 teach a resistivity tool (logging tool for determining resistivity, (Col. 1, Lines 6-17) with a shield over the sensor (coils equipped with electrostatic shields which are well known in the art, Col. 7, Lines 25-29) and a pressure compensating mechanism in a recess in the tubular (spaces in the sensor package are

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filled with insulating oil to maintain hydrostatic pressure, Col. 6, Lines 26-33) to remove high pressure differentials from the sensor package and prevent ingress of borehole fluids (Col. 6, Lines 31-33).

It would have been obvious to one skilled in the art at the time of the invention to modify the invention of Sinclair et al. '293 with the shield and pressure compensating mechanism of Sinclair et al. '696 to remove high pressure differentials from the sensor package and prevent ingress of borehole fluids.

Claims 20, 35, 36, 38, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinclair et al. (5428293) and further in view of Clark et al. (4949045).

With respect to Claim 20, Sinclair et al. disclose the invention as shown in Claim 10 above, but lack the teaching that the shield positioned over the induction or propagation antenna comprises at least one slot filled with an insulating material.

Clark et al. teach a resistivity tool (well logging apparatus for determining formation resistivity, Abstract), which has a shield assembly on the tubular to cover the induction antenna (shield is provided on the recess (Col. 22, Lines 42-44), where the transmitting antennas are contained in the recesses (Col. 22, Lines 29-32) and the shield is a conductive metal cylinder with slots in the axial direction and the slots are filled with rubber, Col. 22, Lines 42-55). Clark et al. teaches that the shield is necessary to allow the tool to withstand the combined effects of pressure, temperature and water

incursion that are particularly severe during drilling (Col. 6, Lines 22-29) and that the slots in the shield are necessary to short the current path.

It would have been obvious to one skilled in the art at the time of the invention to shield the sensors of Sinclair et al. with the slotted conductive metal cylinder of Clark et al. to provide protection from the severe effects of pressure, temperature and water incursion that are present in the borehole environment during drilling and to short the current path.

With respect to Claim 35, Sinclair et al. disclose a method for building a resistivity tool using an elongated tubular having a longitudinal axis and adapted for disposal within a subsurface formation (MWD resistivity system, Abstract), comprising

disposing a lateral resistivity sensor in a recess in the tubular (HTR system is wound on toroidal forms positioned in grooves and operates at a few kHz (Col. 5, Lines 32-42 and Fig. 2, transmitter coils 16, 26 and receiver coils 14, 24) which is associated with shallow depths of investigation (Col. 2, Lines 19-23));

disposing an induction or propagation resistivity antenna on the tubular (CWR system is wound axially about the drill collar and operates at 2 MHz (Col. 5, Lines 26-30, 53-60 and Fig. 2, receivers 15, 25 and transmitters 19, 29, 17, 27) also, high frequency transmission is associated with maximum depth of investigation (Col. 2, 19-23)); and

Sinclair et al. shields and protects the coils with a epoxy resin potting (coils are shielded, Col. 4, Lines 15-24) also, each sensor is sealed by epoxy resin potting (Col. 4,

Lines 35-39)), but lack the teaching of a shield assembly on the tubular to cover the lateral resistivity sensor and adapted to prevent electric current flow in the shield in a direction parallel to the longitudinal axis of the tubular near the lateral resistivity sensor.

Clark et al. teach a resistivity tool (well logging apparatus for determining formation resistivity, Abstract), which has a shield assembly on the tubular to cover the lateral resistivity sensor (shield is provided on the recess (Col. 22, Lines 42-44), the transmitting antennas are contained in recesses, Col. 22, Lines 29-32) and adapted to prevent electric current flow in the shield in a direction parallel to the longitudinal axis of the tubular near the lateral resistivity sensor (shield is a conductive metal cylinder with slots in the axial direction to short circuit the current path, and is insulated on the underside of the shield surface, Col. 22, Lines 42-55). Clark et al. teach that the shield is necessary to allow the tool to withstand the combined effects of pressure, temperature and water incursion that are particularly severe during drilling (Col. 6, Lines 22-29).

It would have been obvious to one skilled in the art at the time of the invention to shield the sensors of Sinclair et al. with the slotted conductive metal cylinder of Clark et al. to provide protection from the severe effects of pressure, temperature and water incursion that are present in the borehole environment during drilling.

With respect to Claim 36, Sinclair et al. and Clark et al. disclose the invention as shown in Claim 35 above, and Sinclair et al. further teach that disposing the lateral

resistivity sensor comprises disposing a base layer of an insulating material (the base layer is understood to be the "donut shaped, magnetically permeable core" disclosed in the specification in Paragraph 0009) in the recess in the tubular, and a toroidal antenna comprising a toroidal core and a conductive wire wound around the toroidal core (sensors are formed by loops on a bobbin (Col. 4, Lines 35-39), induction coil sensor loops are several turns of fine wire (induction coil reference, www.whatis.com)), wherein the toroidal core comprises a magnetically permeable material wrapped around the insulating base layer (the HTR coils are wound on magnetically permeable toroidal forms positioned in grooves, Col. 5, Lines 32-35).

With respect to Claim 38, Sinclair et al. and Clark et al. disclose the invention as shown in Claim 35 above, and Clark et al. further teach that the shield comprises an insulating mechanism to prevent electric current flow along the shield in a direction parallel to the longitudinal axis of the tubular (the shield is a conductive metal cylinder with slots in the axial direction to short circuit the current path, and is insulated on the underside of the shield surface, Col. 22, Lines 42-55).

With respect to Claim 40, Sinclair et al. and Clark et al. disclose the invention as shown in Claim 35 above, and Clark et al. further teach disposing an electrically insulating material between a junction formed between the shield and the tubular (the shield is insulated on the underside of the shield surface, Col. 22, Lines 42-55)

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sinclair et al. '293 and Clark et al. as applied to Claim 35 above, and further in view of Sinclair et al. (6100696).

With respect to Claim 37, Sinclair et al. and Clark et al. disclose the invention as shown in Claim 35 above, but lack the teaching of adapting the recess in the tubular with a pressure compensating mechanism.

Sinclair et al. '696 teach a resistivity tool (logging tool for determining resistivity, (Col. 1, Lines 6-17) which provides a pressure compensating mechanism in a recess in the tubular (spaces in the sensor package are filled with insulating oil to maintain hydrostatic pressure, Col. 6, Lines 26-33) to remove high pressure differentials from the sensor package and prevent ingress of borehole fluids (Col. 6, Lines 31-33).

It would have been obvious to one skilled in the art at the time of the invention to modify the invention of Sinclair et al. '293 and Clark et al. with the pressure compensating mechanism of Sinclair et al. '696 to remove high pressure differentials from the sensor package and prevent ingress of borehole fluids.

Allowable Subject Matter

Claim 18, 21 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

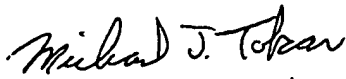
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 4739325, 6671880 B1 as disclosing logging tools with toroidal antennas in recesses.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Diane E. Jones whose telephone number is 571-272-8453. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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